

SEMINAR

Hosted by: Interdisciplinary Training in Mechanobiology from nm to cm

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“Biomechanics of the Female Reproductive Tract”

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Friday, March 22

12:00 – 1:00 PM

Jolley Hall, Room 309

***Please feel free to bring your lunch.**

Abstract

Human reproduction is the outcome of a series of complex events that act in concert to produce a living offspring. The detached ovum is transported to the fallopian tube. The spermatozoa are transported to the fallopian tube where fertilization may occur. The newly born embryo (zygote) is driven to the uterine cavity, and is then conveyed to its implantation site in the uterine wall. The placenta is developed to provide the fetus efficient exchange of materials via the maternal blood circulation. The fetus is developed in a dynamic physical environment within the amniotic sac, and at term, uterine contractions push out the baby. These events are driven by synchronized activations of molecular and biochemical procedures which are integrated with physical forces and transport phenomena from cell to organ levels. The physical environment may be passive or active and may include structural, mechanical, chemical and electrical components at all levels. The presentation will review studies on the role of non-pregnant uterine peristalsis in pre-fertilization sperm transport and pre-implantation embryo transport; maternal-to-fetal transport across a tissue-engineered placental barrier model; biomechanics of embryogenesis and biomechanics of infant feeding during breastfeeding.

Biography

David Elad received his DSc in biomedical engineering from the Technion (1982) and is currently a professor of biomedical engineering at Tel Aviv University. His research activities include experimental and computational problems in the respiratory and reproductive systems from cell to organ levels: Transport in the nasal cavity, shear stress and mucus secretion in cultured nasal epithelial cells, uterine peristalsis, transport across a tissue-engineered placental barrier and mechanics of infant feeding. He was a member of the World Council for Biomechanics and presently is a fellow of AIMBE, BMES USA, IAMBE and EAMBES. He is currently the secretary of IAMBE.